Appendix 1: Canadian Abortion Provider Survey (CAPS) 2019 - Research Protocol

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Background

Each year, approximately 100,000 medical (MA) and surgical abortions (SA) are obtained in Canada,[1] and one-third of females will have an abortion in their lifetime.[2] However, the UN Human Rights Commissioner expressed concern in late 2016 over inequitable access to abortion in Canada,[3-5] and called on the Canadian government to improve equitable access to abortion across the country.[6]

Our team completed the first iteration of a Canadian abortion provider survey in 2012,[5, 7] and had administered the same instrument previously among providers in BC.[8] Our 2012 national cross-sectional paper and online survey measured baseline data on characteristics and distribution of abortion providers, characteristics of abortion practices and experiences of harassment and stigma (data published, some in progress).[5, 7, 9-11] We observed overall high quality-of-care techniques and service following international guidelines.[9, 10] Our first cross sectional Canadian Abortion Providers Survey in 2012[5, 7] was able to capture responses from 178 providers who performed 90.4% of all abortions reported by the Canadian Institutes for Health Information (CIHI) for the same year.[5, 12] In the 2012 survey, we identified four important health system and service shortfalls in Canada, each of which has undergone rapid change since then:[5, 7]

First, while earlier, safer, closer-to-home MA comprises ~95% of first trimester abortions in many European countries (where mifepristone has been available for decades)[13-17] our 2012 Canadian study found that MA (using less optimal MA regimens with methotrexate available at that time), *only contributed to 4% of first trimester abortions*.[7] In 2017, mifepristone became available in Canada, providing the potential to increase the proportion of MAs.[18, 19]

Second, the concurrent 2012 U.S. survey (conducted in collaboration with ours), showed that half of all MA care was provided by non-physician health professionals. However, *in 2012, Canada permitted only physicians to perform abortions*.[20] Evidence supports the effective and safe provision of MA using mifepristone by a range of primary healthcare professionals.[21, 22] In 2017, this led to the Health Canada approval of nurse practitioners (NPs) to provide MA for the first time in Canada's history[23].

Third, we found a *paucity of providers* – fewer than 300 providing abortion in Canada according to our 2012 survey).[5] Based on the registration to our on-line Canadian abortion provider community of practice support platform, facilitating implementation of MA across Canada (www.caps-cpca.ubc.ca), the number of professionals delivering abortion care has more than doubled compared to the results of our 2012 survey.[24]

Fourth, in 2012, we demonstrated vast *urban/rural disparities in provider distribution* favouring urban centers providing SA. Additionally, there were disparities between provinces.[5] Preliminary data indicate an increase in rural and primary care MA providers, offering confidential closer-to-home services which may avoid abortion protesters.[24] This has the potential to redraw the map of abortion provision in Canada.

The SOGC issued evidence-based *clinical practice guidelines* on medical abortion in 2016[25] and an update on surgical abortion in June 2018.[26] The degree of knowledge translation into practice has not yet been assessed. Another aspect of quality of care is tailoring care to diverse patient populations as a component of structural competency. Structural competency is a framework for conceptualizing and addressing health-related social justice issues that emphasizes diagnostic

recognition of economic and political conditions producing and racializing inequalities in health[27].
These changes have created a uniquely opportune time to assess the implementation and impact of this paradigm shift in abortion health workforce and service delivery.
We therefore aim to conduct a cross-sectional online survey of abortion providers throughout Canada to assess the characteristics and distribution of the actual health workforce, the characteristics of abortion practices in relation to clinical guidelines, and the resilience and retention of both new and ongoing abortion providers with respect to harassment and stigma. This work will provide crucial evidence to inform health policy, system and service leaders and regulators charged with providing equitable, free-of-harassment, and high-quality nation-wide access to abortion services.

Design and Methods

This is a cross-sectional online survey of health care professionals providing abortion care (physicians, Nurse Practitioners (NP)), and abortion service administrators across Canada in 2020, to determine characteristics of the provider workforce and their quality of care and resilience in the previous year (2019). Our study's design, data collection and analysis will follow the STROBE checklist for reports of observational studies.[28]

Study Purpose

By conducting a cross-sectional online survey we aim to explore the changes in medical and surgical abortion services workforce and clinical practices compared to our 2012 survey in Canada; particularly in relationship to the 2017 introduction of mifepristone medical abortion, to policy changes, changes in scope of practice for nurse practitioners (NPs) that allow them now to independently provide medical abortion and changes to updated guidelines.
Our goal is to provide high-quality pan-Canadian survey data to inform abortion care planning for leaders of health policy, systems, services, and professional organizations in order to ensure and improve equitable high-quality abortion care in Canada.
While this was not an original purpose of the study we have included one open-ended question at the end of the survey to ask about COVID-19 related provider experience. This is to acknowledge the impact COVID-19 might have had on their practice and will inform future research.
Aim 1: Document the change in characteristics and distribution of the abortion care workforce since the 2012 Canadian Abortion Provider Survey.
We will document the total number of providers, as well as their demographics, including: provider gender, geographic distribution (province/region, rural vs. urban), training (physician and their specialty, NPs) and specific abortion services offered (1st, 2nd and 3rd trimester MA, 1st and 2nd trimester SA) and number of abortions performed during 2019.
Rationale & Justification: 1. Advent of mifepristone for MA in Canada. 2. Addition of NPs as abortion providers. 3. A series of Health Canada regulatory improvements to the administration

and distribution of mifepristone. All these changes announced from July 2015 to Nov 2017 have placed Canada at the vanguard among developed countries globally. As summed up by Health Canada's Chief Medical Officer: "[mifepristone] will now be treated like any other drug in Canada."[28] This contrasts with restrictions in other countries that limit dispensing. Understanding new aspects of care and innovative service delivery models, through surveying health professionals nationally, has the potential to advance abortion quality of care and access, and to inform regulatory bodies throughout the world.

Hypothesis and expected outcomes: We anticipate the following changes:

1. An increase in abortion providers (especially Family physicians (FP) and General Practitioners (GP)) in the health professional workforce;
2. An increase in non-physician abortion providers (such as NPs);
3. An increase in the proportion of first trimester (mifepristone) medical abortions, among all abortions;
4. An increase in provision of abortion services in rural and remote areas

Aim 2: Assess the quality of care, i.e., characteristics of actual abortion practices as compared to the revised Canadian clinical practice guidelines, in both MA and SA practices.

To achieve this objective, we will explore characteristics of abortion care provided and the extent to which abortion providers follow evidence-based guidelines for 1st and 2nd trimester SA and MA. We will also evaluate delivery of MA services unique to Canada, such as the provision of MA via telemedicine and care of patients who self-determine when and where to begin their abortion. Another aspect of quality of care is tailoring care to diverse patient populations.

Rationale & Justification: 1. Revised national guidelines were published in 2016 and 2018, but uptake of these guidelines has not been measured. 2. There has been an increase in number of abortion providers whose quality of care has not been assessed. 3. Mifepristone MA care is newly available in Canada and has not been assessed. 4. Several aspects of MA care such as dispensing regulations are unique. While the updated guidelines have the potential to facilitate implementation of evidence-based, high-quality abortion services, the degree of uptake into practice has not yet been assessed. While most providers will be considerate pf diverse patient populations, there might be variation between providers

This is especially important in light of the growing number and diversity of new abortion providers.[24]

Hypothesis and expected outcomes:

1. Most of experienced and new abortion providers deliver high quality of care;
2. Most of providers adhere to Canadian clinical guidelines regarding ***MA****;*
3. Most of providers adhere to Canadian clinical guidelines regarding ***SA****;*
4. Most of providers are considerate of diverse patient populations
5. Most providers are considerate of diverse patient populations

Aim 3: Determine to what extent providers experience harassment and stigma in their work and explore their related resilience and retention.

We will assess abortion providers' experiences with stigma and harassment, using a validated survey previously administered to Canadian and U.S. abortion providers. We will further ask about logistical barriers and gender identity and explore how they relate to provider retention.
Rationale & Justification: 1. In 2012, 34% of Canadian abortion providers reported harassment (mostly picketing).[5] 2. The stigma scale showed a moderately high stigma score (3.6 out of 5).[11] 3. This may be different for new providers, especially in rural areas or among NPs. The provider's experience is an important factor that influences delivery and quality of abortion services, recruitment and resilience of workforce. This experience can include positive aspects, but also logistical barriers, harassment, typically from public sources, and stigma within their professional, public or private lives, all of which affect resilience and retention. While less frequently reported in Canada compared to the US,[29 5, 11, 30, 31] stigma, harassment and history of terrorists shooting Canadian abortion providers[32, 33] warrant surveillance, particularly among those new to this specific and uniquely vulnerable workforce.
Hypothesis and expected outcomes:

1. Positive and negative provider experiences are being reported and affect resilience;
2. Increase in the abortion-provider workforce might affect stigma and harassment experienced especially by new and rural providers; and
3. Provider gender identity may affect personal and professional interaction as abortion provider.

Study Population

The study population consists of all (estimated to be approximately 700) health care professionals providing abortion care (physicians, nurse practitioners) and abortion service administrators (such program manager or medical director or operation leads) across Canada.

Inclusion Criteria

We invite potential participants meeting the following inclusion criteria to participate in the study:

- Physician and NPs providing abortion care who have completed their professional training (school, residency, fellowship)

OR

- Abortion service administrator such as program manager or medical director or operation lead

AND

- Have provided abortion care for a live embryo/fetus/pregnancy in 2019, as described below:

- have prescribed at least one first trimester medical abortion functioning as an independent MRP (most responsible provider)
  OR
- have performed at least one surgical abortion as an independent MRP (most responsible provider)
  OR
- have provided at least one second or third trimester medical abortion functioning as an independent MRP (most responsible provider)
  OR
- have provided administrative support for abortion services

AND

- Are able to read and write in English or French

Exclusion Criteria

The study is specifically aimed at health professionals (physicians and NPs) independently providing abortion care in Canada. Other health professionals will be excluded.

Recruitment

In addition to recruiting health care professionals with a focus in abortion work, we plan to cast a wider net than in our 2012 survey by inviting all family physicians, general practitioners, maternal fetal medicine specialists and NPs who potentially provide abortion care as part of their clinical practice. This will more accurately reflect the complete current workforce. In order to invite and recruit health care professionals (physicians and NPs) providing abortion care and abortion service administrators, we will use multiple sources.
We will contact the following channels to request their promotion of our study:
Publicly available sources: abortion services and clinics advertised in the Internet, public health centers (e.g. Local community services centres (CLSC) in Quebec) and hospitals. We will also contact publicly listed university departments, physicians, and nurse practitioners advertising women's health care.
The extensive professional networks of CART-GRAC and its partner organizations including the national health care organizations (http://cart-grac.ubc.ca/about-us/collaborating-organizations/); these organizations such as the Society of Obstetricians and Gynaecologists of Canada, Canadian Society for Maternal Fetal Medicine, College of Family Physicians of Canada, Canadian Nurses Association, National Abortion Federation and Actions Canada will advertise to their members on our behalf.
Our web-based community of practice platform (www.caps-cpca.ubc.ca) contact lists of abortion providers who have participated in current and past research projects of our team and have provided permission for our team to contact them for future research.
For any of these channels that accept our request to promote the study we will provide any material for recruitment. These materials might include a survey invitations they can send to

their membership via email, listserv or newsletter, and postings on their respective websites. Potential participants will be invited to participate in the self-administered, anonymized electronic survey. The invitation letter includes information about the study and inclusion criteria. The invitation letter further includes a link to the REDCap (Research Electronic Data Capture) survey. Additionally, they will allow us to introduce the study at their continued medical education (CME) events, regional and national meetings. We have intentionally included multiple of these organizational stakeholders as knowledge users and collaborators in our research team and worked with them and their organizations to inform our recruitment strategy.

We will use a modified Dillman technique to ensure a high response rate from potential participants invited via email[34]: partnering organizations will send a reminder e-mail one and two weeks after the first contact. They will send a third reminder 4-6 weeks after first contact. The actual number of abortion providers in Canada is not known. In order to better understand the denominator of abortion providers and the response rate we ask providers who we invite to participate to follow a link to a REDCap survey in order to indicate if they do not meet inclusion criteria for the study.

Due to compelling scientific rational we allow investigators, collaborators and knowledge users on the research team who are also abortion providers and meet eligibility criteria to participate in the survey. Approximately 50% of investigators and knowledge users each are eligible to participate. They will receive an invitation to participate as they are members of various professional organizations that recruit on our behalf.

Scientific rational to allow them to participate:

1) Especially for 2nd trimester abortion services we anticipate that there are few providers in Canada. Several of them are Co-Is or KUs. Including them allows to better achieve our research project aims:
    a. aim 1 workforce:
        i. we will more accurately estimate the number of providers
        ii. will have a better understanding of the workforce
        iii. we will more accurately estimate the number of procedures
        iv. overall we will avoid skewing the data the way we would by excluding them
        v. we are in a "niche role and our experiences would be beneficial to the scientific community"
    b. aim 2 quality of care:
        i. we will more accurately measure quality of care. As many of the team members have written the SOGC guidelines and excluding them might skew the quality
    c. aim 3 stigma:
        i. we will possibly more accurately measure the experience of stigma and resilience
2) the same is true for 1st tri services as well, but as we except the number of providers to be larger, the impact will be less substantial

Procedures

Potential participants will be invited to participate in the self-administered, anonymized electronic survey. The invitation letter includes information about the study and inclusion criteria. The invitation letter further includes a link to the REDCap (Research Electronic Data Capture) survey. The survey will begin after a consent statement has been reviewed and accepted by the participant. An English and a French version will be available. Translations of the 2019 survey will be conducted by native French speaking co-investigators and will have been verified by practicing bilingual native-Francophone abortion providers to ensure accuracy and relevance. All data is directly entered into the BCCHR REDCap online platform.
The survey has multiple sections (see below). Initially participants will be asked to complete a demographics section. Depending on their answers regarding profession, role in abortion care and clinical practice they provide, they will be asked to complete additional sections of the survey. This step will be managed by the conditional branching logic functionality in REDCap. Branching logic furthers determines which individual questions within a section are asked. After updating the 2012 survey to reflect current relevant workforce and practices, the CAPS 2019 survey sections are as follows:

Section 1	Demographics	
Section 2	Clinical abortion practices:	First trimester medical abortion (FTMA)
		First trimester surgical abortion (FTSA)
		Second trimester surgical abortion (STSA)
		Second / Third trimester medical abortion (STMA; Induction of labour)
Section 3	Administrator	
Section 4	Diverse populations	
Section 5	Stigma and resilience (Experiences as a provider and administrator)	
Section 6	Remuneration and future research	

All participants will be asked to complete sections 1, 4, 5 and 6. Clinicians will be asked to complete section 2. The greater the range of abortion care a participant provides (covered in section 2), the longer it will take to complete the survey. Administrators will be asked to complete section 3 instead of section 2. We ask invited providers who do not meet inclusion criteria to indicate this via following a link to a separate survey project within REDCap that only counts the number of those responses.

Remuneration

At the end of the survey we offer each participant remuneration in form of a $50.00 CAD Amazon gift certificate which we will send via email if the participant provides us with their e-mail address. Investigators, collaborators and knowledge users who chose to participate are not eligible to be remunerated. Due to fraudulent responses, remuneration for end of November and beginning of December 2020 will only be sent after asking participants who have asked for remuneration via email to verify that they meet inclusion criteria.

Data management and confidentiality:

We will collect and store self-entered participant information in REDCap (Research Electronic Data Capture). REDCap is a web-based, metadata-driven electronic data capture software solution and workflow methodology for designing and capturing data for research studies. REDCap allows users to build and manage online surveys and research databases quickly and securely. REDCap at BC Children's Hospital (BCCH) is managed by the BCCH Research Data Management team in collaboration with BCCH Research IT services office. BCCHR IT is responsible for creating REDCap database backups and these backups are stored at Iron Mountain Canada, ensuring that all data and backups are stored in Canada. The CRSU stores study data in a secure, firewall protected server with only the https port available to internet. There is a web application server that is the only gate to connect to the Database server, where the information is stored.

The only personal identifier we collect is the participant's email address, which we ask for in order to provide remuneration, or in case they would like to be contacted either with study results or for future research. REDCap does not collect IP addresses. Personal identifiers collected on the survey are stored in a separate project within REDCap. Only the PI and the designate will be given permission to see the personal identifier. We will export personal identifiers from the REDCap BCCHRI server weekly and store them in an encrypted file, in a restricted access folder on the "W" drive which is stored on the secured PHSA server. Email addresses provided solely for the purpose of remuneration will be deleted once the participant has received the gift card and data integrity has been assured, while emails for future research or results purposes will be saved.

Participants are able to stop the survey at any time by clicking "Save & Return Later" at the bottom of the page. They will be provided with a pop-up of a randomly generated 8-character section specific return code, which is needed to return to the survey. They get the following information on a page with 3 options:

1. They can click "Continue Survey Now"

OR

2. They can bookmark the page to return to the survey later. When they return, they will be able to input their code continue at the point at which they left off.

OR

3. They can choose to have the survey link emailed to them by providing their email address. The return code will not be included in the email and their email addresses will not be stored. When they return, they will be able to input their code and continue at the point at which they left off. Embedded in the survey is a document with step by step instruction on how to "Save & Return Later".

The remainder of the survey data will be collected in its own project within REDCap and only the PI, designate and the data analyst will have access to the anonymized data. Once the survey is closed we export this data from the REDCap BCCHRI server and will store it in a format ready for analysis, in an encrypted file, in a restricted access folder on the "W" drive which is stored on the secured PHSA server. Only the only the PI, designate and the data analyst will have access to this anonymized data. No survey data set will include personal information. Besides the data collected within the instruments or surveys themselves, REDCap does not collect any personal information from survey respondents. IP addresses of survey respondents are not collected by REDCap.
Invited providers indicating that they do not meet inclusion criteria do so by following a link to its own REDCap project. The management of that data is the same as described for the other survey data above and does not contain personal information. REDCap does not collect IP addresses of these providers either.
All participants will have the contact information of the study team should they have any questions or concerns with respect to the study. Any participant may choose to withdraw from the survey at any point in time. If an individual withdraws during the survey, their contributions up to that point will be included. Incomplete survey data will be stored securely in REDCap as is the completed survey data. If the participant has not given their email address, then there is no personal identifier. If they have given their email address, it will be stored separately.
Data integrity monitoring:
Survey data and E-mail addresses will temporarily be linked in order to examine for data integrity, as we have identified fraudulent respondents. Storage of those files will be on the "W" drive, only the PI and their designate will have access to those files. Once the data integrity has been examined (anticipate 2 months) the data will be delinked again and the linked data files be deleted.

Analysis:

We will use R statistical software for analysis.
Aim 1: We will use descriptive statistics for the characteristics of the workforce including demographics, training and type of abortion services provided. We will further compare characteristics by type of abortion services and geography (province/region, rural vs. urban) using Chi-square or Fisher's exact tests for categorical variables and t-tests, ANOVA, Wilcoxon rank sum tests or Spearman's rank correlation for continuous variables. For clinic characteristics, we will examine regional differences, facility type, and size of facility (categorized by the total number of combined first and second trimester SAs and MAs provided annually: small (<500 cases), medium (500-1000 cases), or large (>1000 cases)).
We obtain the first three digits of the postal code to designate rural versus urban. We plan to the following approach:

a. Google each individual postal code to identify the geographic area
b. Search the website below to identify the population of the geographic area https://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Facts-cma-eng.cfm?LANG=Eng&GK=CMA&GC=535&TOPIC=1

c. If the geographic area meets the definition for Stats Can 2016 census CMA, we will label it urban. If the criteria is met for a census agglomeration (CA) (or less), we will label it rural.

Aim 2: We will use descriptive statistics for the clinical practice. As for aim 1, we will further compare clinical practice between provider types and geographic areas. For areas of practice exhibiting high variability, we will use multivariable regression models to explore clinic- and individual-level characteristics associated with these practices, while adjusting standard errors for clustering at the clinic level.

Aim 3: Consistent with previous publications using the provider stigma scale[30, 31, 35, 36]we will calculate composite scores, with higher values indicating greater experience of stigma. As for the aims above, we will analyse results between provider types, their demographics, geographic areas, and type of abortion care. We will further explore the relationship between provider gender identity and their experiences.

Statistical comparisons between subgroups of health care providers, different demographic characteristics, geographic areas (province/region, rural vs. urban) or type of abortion care, will be made using univariate and exploratory multivariate analyses, as appropriate, and when warranted by a sufficient number of respondents in each category. Due to multiple testing, we will use a $p < 0.01$ as significant value for all our comparisons.

We will use a content analysis[37, 38] approach to analyze the qualitative responses to open-ended questions. Following an interpretative approach, we will seek to investigate the underlying meaning and intentions of the participants' responses (*latent* analysis). Preparation for analysis will involve immersion in the data through reading and re-reading, followed by organization and coding performed by two researchers trained in qualitative approaches: (1) open coding and creating categories, (2) grouping codes under higher order headings, (3) formulating a general description of the research topic through categories and subcategories; and (4) reporting the results through a descriptive narrative. Data analysis and category development will be iterative. Discrepancies in interpretation will be resolved through discussion with a third researcher. Data organization will be facilitated by NVivo analysis software (version 11.4). We will consider emerging patterns within and between participants and with the previous literature, the frequency of concepts across participants, presence of conflicting concepts across participants, and perceived relevance of the concepts to inform the growth of high quality, equitable, and accessible abortion care in Canada from health policy, system, service, and training perspectives.

Based on the ongoing registration of providers to the community of practice website, our target sample frame projection for 2019 is approximately 825 Canadian abortion providers. Based on our 2012 survey, we anticipate a response rate of approximately 80% (700 abortion providers). A sample of that size will allow us a margin of error of +/- 4% at a 95% level of confidence for most estimates. In addition, we will be able to detect differences as small as 12% between subgroups of respondents with 80% power and two-sided alpha of 0.01 to mitigate the effects of multiple testing.

No data will be published that would allow individual facilities or providers to be identified. We will combine categories of variables to larger groups in any case that leaves 5 or fewer participants in a category that is potentially identifying, such as small geographic area or small

participant response rate and known small provider volume to prevent disclosure of participant's identity.
Incomplete survey data will be analyzed, and we will use the same strategy as for complete surveys to prevent disclosure of participant's identity. Given that their data is anonymized we would not be able to identify their individual data and therefore, cannot offer to remove it.
Analysis will not be stratified by investigator, collaborator or knowledge user status as we do not collect this in formation in the survey and as the survey is anonymized.

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